

REMARKS

In the final Office Action mailed May 2, 2007, claims 1-29 were rejected under §103 as being unpatentable over Millio in view of Asselin and Taylor. The Advisory Action of February 5, 2008, maintained the rejections.

In the present Response, amendments have been made to the independent claims 1, 9, 14 and 22 to more clearly recite the present invention.

With respect to the continued rejection of the claims under §103, the Applicant continues to emphasize that the FlashCopy function to which the present invention pertains is different from the concurrent copy discussed in some of the cited references. The concurrent copy function enables a copy of data to be made while an application is updating that data. The copy is "in a consistent form, as it existed before the updates took place ... as though the updates had not occurred." (Asselin, pg. 1) Data is copied concurrently with normal operations. By contrast, when the FlashCopy function is invoked, a FlashCopy relationship is established between a source volume (to which a copy of the data has been transferred from the primary storage unit, as explained in paragraph 23 of the Specification) and a target volume, thereby providing a mapping of the source volume and target volume to allow a point-in-time copy (based on consistency groups) of the source volume to be copied to the target volume. The operation is nearly instantaneous and copies are "immediately" available for read and write access. Consequently, the Applicant reiterates that the cited combination cannot render the claims obvious because it is directed towards a different function.

On page 3 of the final Office Action, the Examiner referred to the Applicant's assertion made in a previous Response that "in none of the cited references are multiple volumes the focus of the attention." The Applicant maintains that assertion. The Office Action cites Milillo to the effect that Fig. 2 and the related discussion pertains to just a single PPRC volume pair but that additional pairs may be included. The implication is that the invention of Milillo is applicable (although not exclusively so) to a single-pair environment. However, the problem towards which the present invention is directed pertains to an environment in which a consistency group may be distributed over many storage volumes, possibly in many storage controllers (Specification,

paragraph 26). In such an environment, the FlashCopy command may not be executed simultaneously by all of the source volumes. As discussed in paragraphs 26 and 27, that may not present a problem as long as no write request is received or no event occurs which interrupts the FlashCopy operation. If, however, such an event occurs, the consistency group of source volumes may become inconsistent. Moreover, because the FlashCopy operation may have been completed between some (but not all) of the source volumes and the corresponding target volumes, the target volumes are no longer consistent, containing a mix of both old and updated data, and do not comprise a consistency group. If a failure occurs at this time, data recovery may not be possible. The present invention addresses the problem by making sure that all of the source volumes have been successfully prepared for the FlashCopy operation before committing to complete the operation. If preparations are fully successful, the entire prior consistency group in the target volumes is replaced; if the preparation of any source volume is unsuccessful, the entire operation is cancelled and the still-intact prior consistency group in the target volumes is maintained and can be used to recover from a subsequent failure.

The final Office Action and the Advisory Action conceded that neither Milillo nor Asselin teach "committing a FlashCopy operation of the consistency group from the FlashCopy source volumes to the corresponding FlashCopy target volumes if the preparation of all FlashCopy source volumes is successful" or "reverting the FlashCopy operation if the preparation of any FlashCopy source volume is unsuccessful, whereby the prior consistency group is maintained in the FlashCopy target volumes." The Actions then cite paragraph 40 of Taylor as teaching these steps. However, Taylor is directed towards backing up and restoring "parallel server databases" in which multiple nodes in an MPP or SMP system simultaneously access the database. It does not relate to FlashCopy or even concurrent copy. Thus, the Applicant respectfully asserts that Taylor is not an appropriate reference for the rejection of the pending claims and for this reason alone the rejection should be withdrawn.

With specific reference to paragraph 40, Taylor teaches that it is a database which is prepared for a backup; there is no disclosure or suggestion that an attempt is made to prepare multiple source volumes for backup. There is also no disclosure or

suggestion that if the attempt to prepare any one of the source volumes fails (particularly since Taylor does not include the use of source volumes), then the operation will be reverted. Instead, the system merely "attempts to return to database accessibility" Furthermore, the use of the word "attempt" in paragraph 40 at least implies that a return to database accessibility may not be possible. This is in marked contrast to the claimed invention in which, if the attempt to prepare even one of the source volumes fails, the prior consistency group remains unaffected in the corresponding target volumes. In other words, the present invention prevents loss or corruption of data in the event of a failure in a way not taught by Taylor. Thus, Asselin, Milillo and Taylor do not disclose the elements of the claimed invention and their combination would not produce the claimed invention, thereby being insufficient to support an obviousness rejection.

Furthermore, the motivations cited on page 7 of the Actions (citing Asselin and Taylor), are exceedingly broad "motivations" that could apply to a significant number of data-related inventions. But even so, the cited motivations do not address the problem to which the present invention is directed and one of ordinary skill in the art would not be led to make the cited combination. Therefore, the motivations are also insufficient to support an obviousness rejection.

As substantially the same grounds for rejection were asserted against all of the independent claims, the foregoing comments apply equally to those claims. In addition, the Applicant respectfully asserts that the dependent claims are further allowable based on the allowability of the respective independent claims.

For the foregoing reasons, the claims are believed to be allowable, the Application is believed to be in condition for allowance and a favorable Advisory Action is requested. The Examiner is encouraged to contact the undersigned by telephone if a conversation would expedite prosecution of this case.

This constitutes a request for any needed extension of time. No fee is believed to be due in this instance. The undersigned hereby authorizes the charge of any

deficiency of fees submitted herewith, or the credit of any overpayment, to deposit account number 09-0449.

Respectfully Submitted,

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